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(54) Roof ridge anchor

(57) A roof anchor is provided for location at a roof ridge. The anchor includes first and second clamp members for engaging opposite faces of an upper part or side of a roof truss or a ridge batten. The clamp members may be in the form of plates 24, washers or channel sections. The clamp members are fastened together and secured to the roof truss or ridge batten using suitable fasteners 30. A roof anchorage element, such as a pedestal 40, is secured to the first anchor clamp member by a combination of a clamp 34 and a bracket 36 or a pair of clamps 34. Alternatively, the pedestal 40 may be secured to a first anchor clamp member by using U-bolts which also serve to fasten the clamp members together. The upper end of the pedestal 40 extends above a ridge tile 32 to allow a safety line or the like to be attached to the roof anchor.

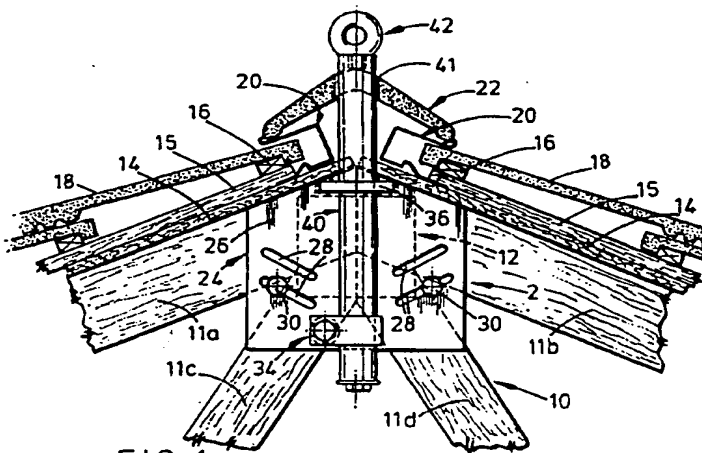


FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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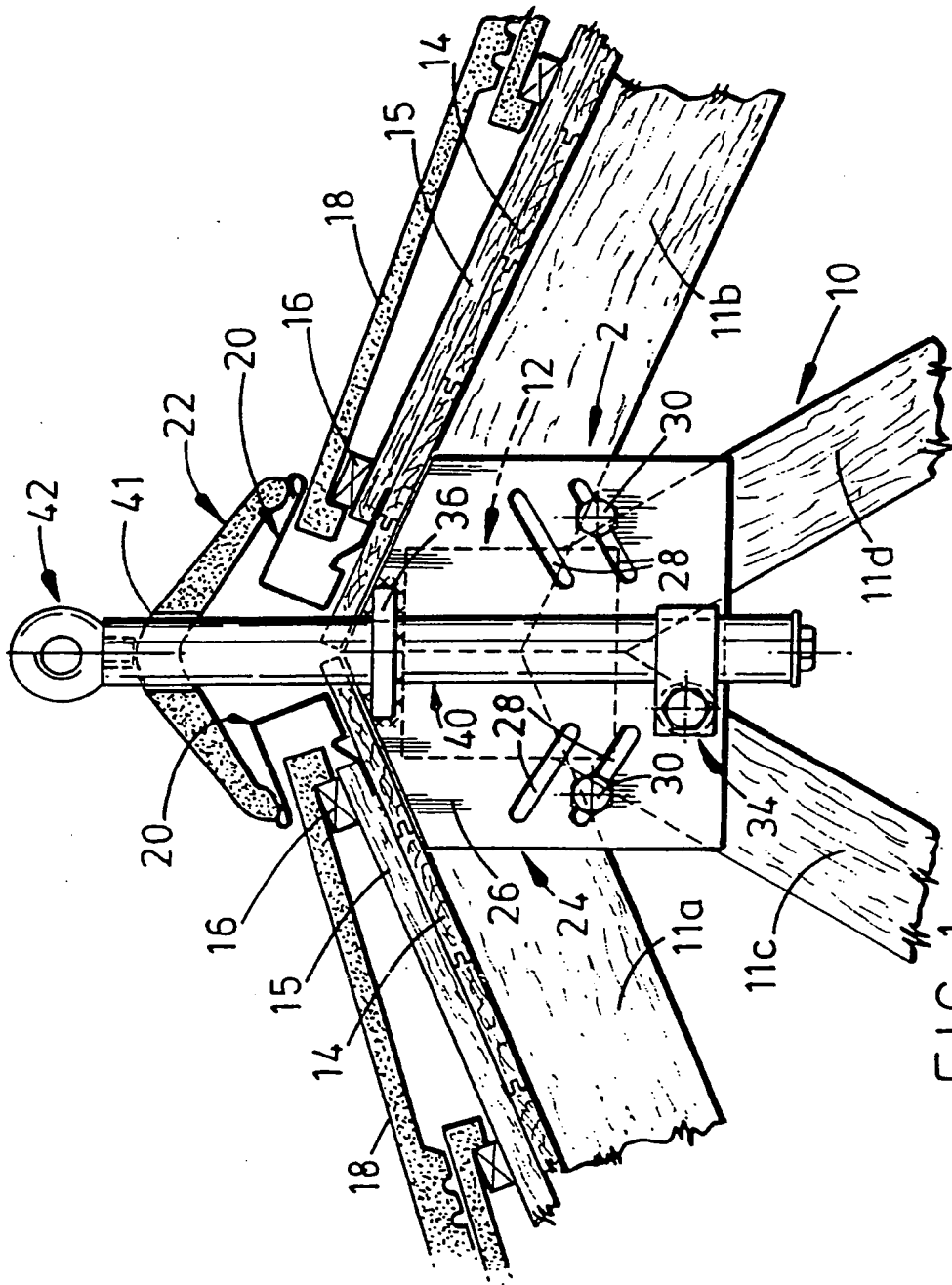
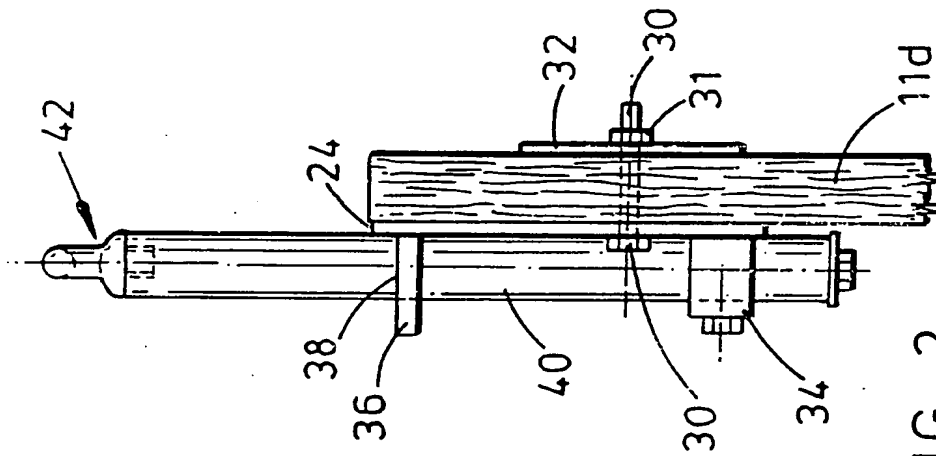


FIG. 1



3 4 5 6

3-8

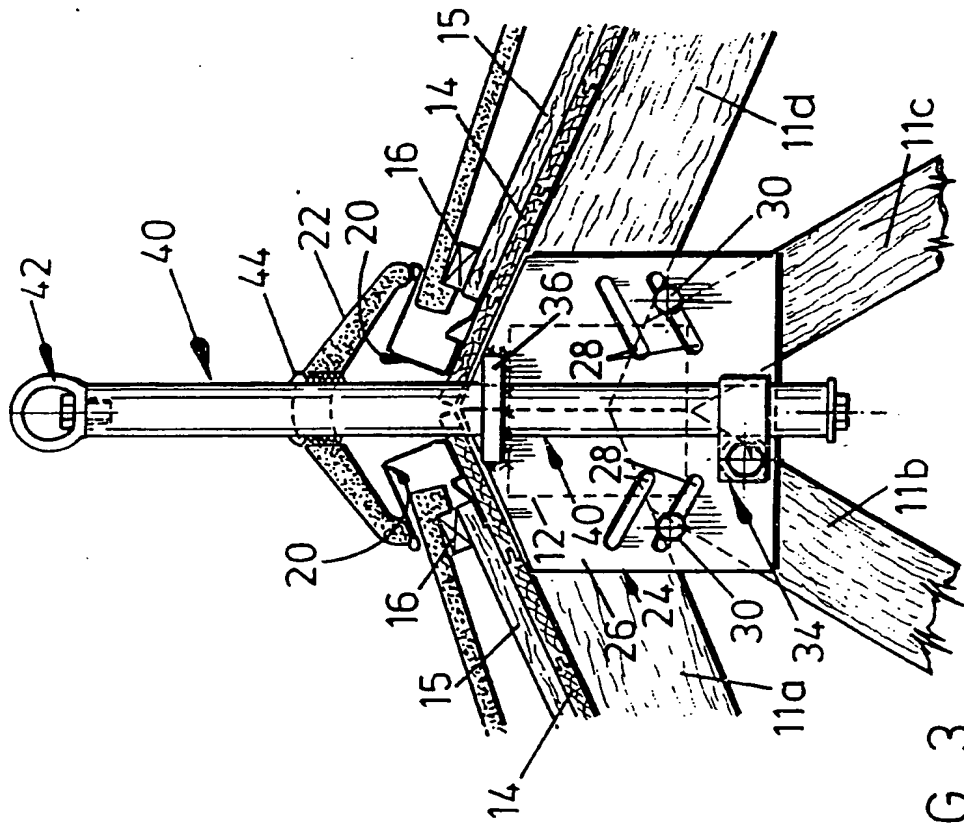


FIG. 3

29 48 35

4-8

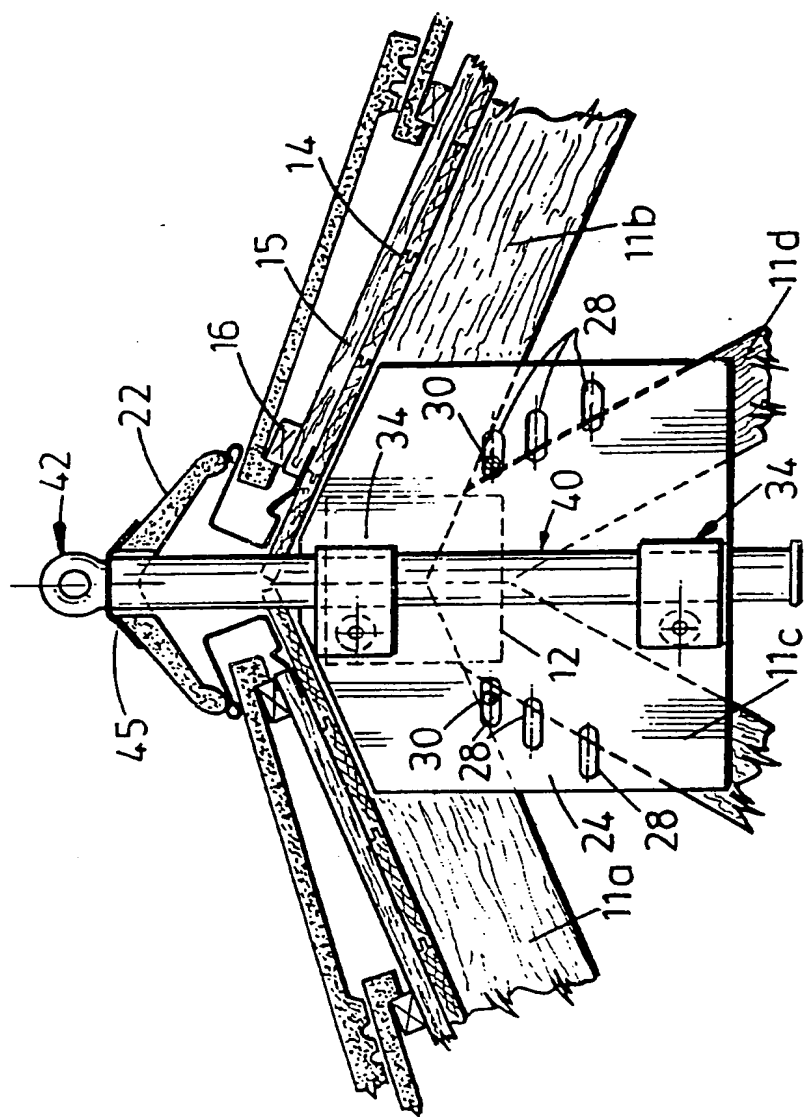


FIG. 4

29 30 31

5-8

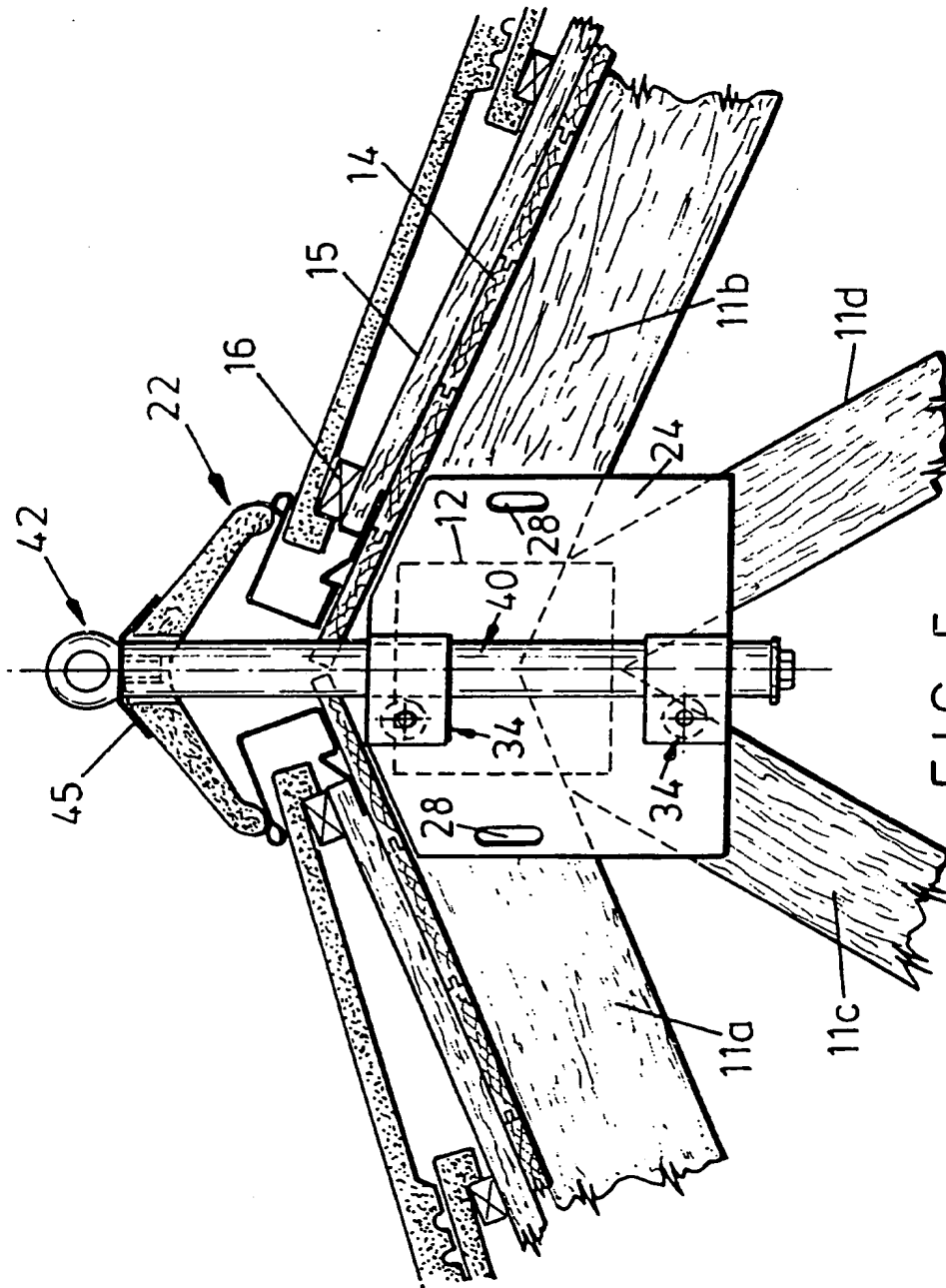


FIG. 5

29 30 31

7-8

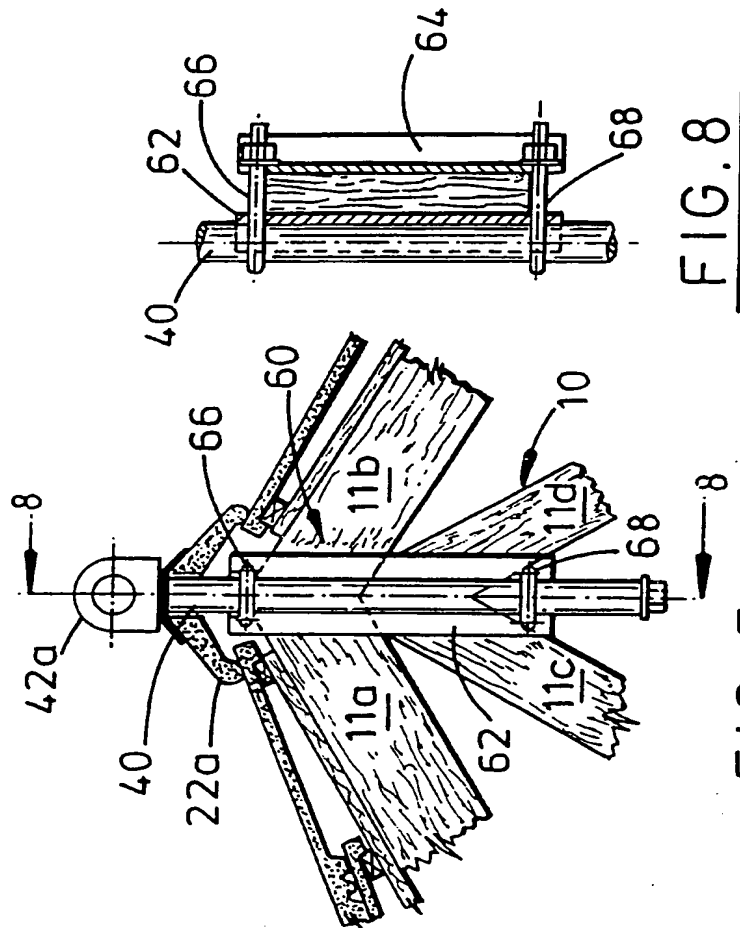


FIG. 8

FIG. 7

29 48 35

8-8

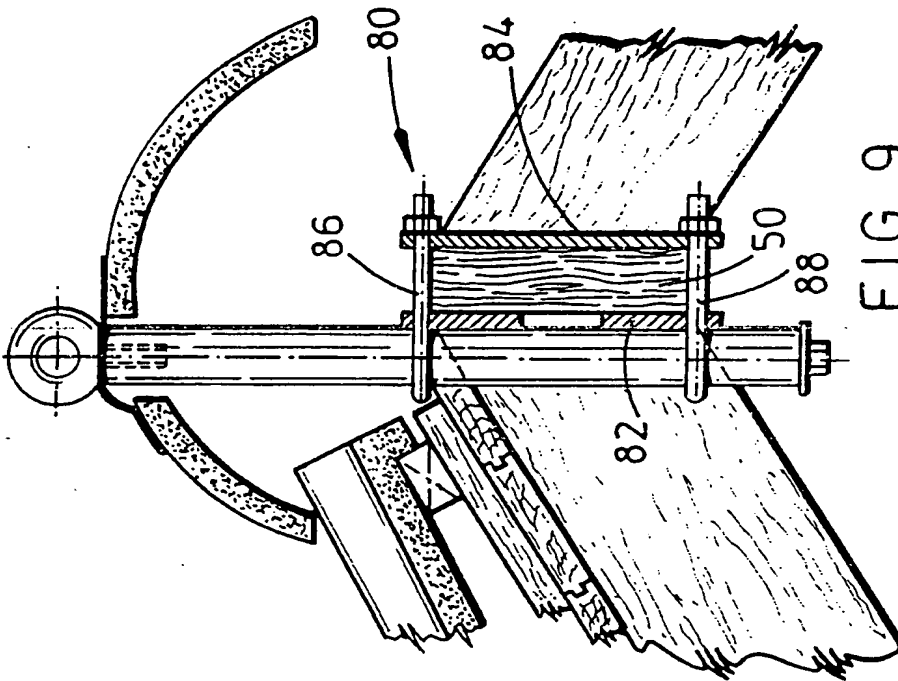


FIG. 9

IMPROVED ROOF ANCHOR

The present invention relates to roof anchors and particularly but not exclusively to roof anchors for use on the ridge of a roof.

5 There is a requirement for roof anchors which are located at the ridge of a roof and which extend through the roof to provide an anchoring facility to workmen working on the roof. An advantage of a ridge anchor is that the workmen can simply move from one side of the roof to the other side using the same anchorage point and it is also
10 the highest point on the roof.

There are known anchorage clamps which can be fitted to a ridge batten. Such clamps consisted of a generally inverted U-shaped member with an integral eye and this ridge anchor is clamped onto the ridge batten using plates
15 through which the U-shaped member passes. Although this type of anchor works well in practice, its use is confined to roofs with ridge battens and it is not readily height adjustable.

U.K. Patent Application No. GB 2251020A discloses a
20 slope-mounted roof anchor which is fitted to a rafter of a roof and which has an elongate post or pedestal with an eyebolt and which can be adjusted to extend above the roof.

This device can be rapidly and easily fitted to a roof rafter. However, with this structure it is not possible
25 to fit the anchor to the ridge of a roof because of

different structural requirements.

In addition, many modern roofs use a truss system where a number of rafters and struts are connected at the ridge point by a truss gangnail plate. This means that
5 the abovementioned existing ridge anchors cannot be used.

An object of the present invention is to provide an improved ridge anchor which obviates or mitigates at least one of the disadvantages associated with the aforementioned roof anchors.

10 In one embodiment of the invention this is achieved by providing a ridge anchor which has a plate which can be fitted over a truss gangnail plate to a truss or fitted to a ridge batten and which includes an adjustable post or pedestal which extends through ridge tiles and terminates
15 in an eyebolt. The pedestal may be of such a length as to provide normal anchorage for roof users or can be in the form of an extended pedestal to suit use with horizontal line safety systems.

In one arrangement the plate contains slots which
20 allow it to be bolted to a second plate on the other side of the roof truss with the advantage of this arrangement being that there is no damage to the roof truss members. The entire ridge anchor is held to the top of the truss arrangement by pressure exerted via bolts. To facilitate
25 this the mounting plate has pairs of slots on either side of the pedestal which facilitate the alignment and securement of the ridge anchor to the truss.

In another arrangement, where rafters permit, the

slots overlay the rafters and the rafters are drilled so that two bolts, one on either side of the pedestal, secure front and back plates together. The back plate can be replaced by washers or bolt securing nuts can be fastened to the bolts without the back plate or washers.

The pedestal is substantially the same as disclosed in GB 2251020A and in one embodiment the plate includes a lower clamping bracket by which the clamp can be secured to the pedestal so as to allow the pedestal to be vertically adjusted. A top pedestal bracket with an aperture for receiving the pedestal is welded to the top of the mounting plate to constrain the pedestal to be moved in the vertical position. In another embodiment, two vertically spaced adjustable clamps may be used.

In this regard it will be understood that the system may be used with a variety of roof tile systems, for example the Marley (RTM) dry ridge system, and in this regard the ridge tile is drilled to accommodate and receive the pedestal passing therethrough. A separate flexible seal may be disposed in the aperture in the Marley ridge tile so as to seal around the pedestal and to prevent the ingress of water, debris and the like beneath the ridge tile, or silicone sealant may be used.

According to the present invention there is provided a roof anchor comprising:

first anchor clamp means for engaging an upper part or side of a roof truss or a ridge batten;

second anchor clamp means for engaging the other side

of said roof truss or a ridge batten;

fastening means for securing said first and second clamp means together and to secure the roof anchor to the upper part of said roof truss or said ridge batten; and

5 securing means for receiving and securing a roof anchorage element to said first clamp means, said roof anchorage element being generally elongate and being adapted to be secured by said securing means to said first clamp means with an upper end portion extending above a
10 ridge tile;

 said roof anchorage element having harness attachment or line fastening means at its upper end to enable a user to secure a safety line or the like to the roof anchor in use.

15 Preferably, said roof anchorage element is a cylindrical pedestal and the harness attachment or line fastening means is an eyebolt.

 Conveniently, the first anchor clamp means is a flat plate with apertures or slots on either side to facilitate
20 the passage therethrough of fixing means, such as bolts, to be secured to the second clamp means on the other side of the truss or ridge batten. Conveniently, the second clamp means is a flat plate. The anchor clamp means need not be plates nor flat; they could be corrugated or have other
25 non-flat profiles such as channel profiles. Alternatively the second clamp means may be washers or nuts for clamping the fixing bolts.

 Preferably also, the first anchor clamp means includes

securing means in the form of a lower adjustable clamp and an upper bracket with an aperture for receiving the roof anchorage element. Alternatively, two spaced adjustable clamps may be used. In another embodiment two spaced U-bolts may serve as both the securing means and the fastening means.

A separate elastomeric seal may surround the roof anchorage element where it passes through the ridge tile or silicone sealant may be used. The roof anchorage element is usually of increased diameter when extended for use in horizontal safety line systems.

These and other aspects of the present invention will become apparent from the following description when taken in combination with the accompanying drawings in which:

Figure 1 is a diagrammatic representation of an end view through a roof at the ridge position showing the top part of a truss and a roof anchor in accordance with an embodiment of the present invention secured to the top of the truss;

Figure 2 is a view taken in the direction 2 of Figure 1 showing how the roof anchor is clamped to the roof truss;

Figure 3 is a view similar to Figure 1 of a roof anchor with the pedestal extended to suit horizontal line safety systems;

Figure 4 depicts a roof anchor in accordance with a third embodiment of the invention in a location similar to that shown in Figure 1 where a plate of the anchor has two spaced clamps;

Figure 5 depicts a fourth embodiment of the present invention where a plate of the anchor is secured through the rafters;

5 Figure 6 depicts a roof anchor in accordance with a fifth embodiment of the present invention for use on roofs with a ridge batten;

Figure 7 depicts a roof anchor in accordance with a sixth embodiment of the present invention;

10 Figure 8 is a sectional view on line 8 - 8 of Figure 7, and

Figure 9 depicts a roof anchor in accordance with a seventh embodiment of the present invention.

Reference is first made to Figs. 1 and 2 of the drawings which depict the ridge part of a roof. The roof
15 is supported by a truss generally indicated by reference numeral 10 which consists of rafters 11a,b, and struts 11c,d which are connected together at the ridge point by a truss gangnail plate 12 shown in broken outline. It will be understood that there are many such trusses which make
20 up the roof and only one is shown in the interests of clarity. Above the truss, sarking 14 is nailed and counter battens 15 are then laid on the sarking together with tile battens 16 on which tiles 18 are secured. The tile system described is a Marley roof tile system and
25 metal channel members 20 are shown secured to the counter battens and which allow the securement of ridge tiles 22 in the position shown. This arrangement of the ridge tile, the channel members and roof tiles is known as the Marley

Dry Ridge System. However, it will be appreciated that other roof tile systems may be used.

5 The roof anchor is generally indicated by reference numeral 24 and consists of a first planar plate member 26 which abuts and overlies the truss gangnail plate and is shaped at the top to fit into the apex of the truss space.

The plate has four oblique slots generally indicated by reference numeral 28, two being disposed on either side of the plate 26, for receiving bolts 30 to secure via nuts 31
10 a second plate 32 disposed on the other side of the truss.

Two bolts 30 are generally sufficient and these bolts pass through the space between the rafter 11a,b and struts 11c,d to ensure that there is no damage to any of the members thereby ensuring that the structural integrity of the
15 trusses is maintained.

The first plate 26 has a lower adjustable clamp 34, similar to that shown in GB 2251020A, and an upper bracket 36 is welded to the plate 26 and has a circular aperture 38 for receiving a pedestal 40.

20 The pedestal 40 is similar to that disclosed in GB 2251020A and is generally cylindrical in shape and has, at its upper end, an eyebolt 42 in accordance with British Standard 5845, although other harness attachment means may be used. The pedestal is 38 mm in diameter when used as
25 a ridge anchor in the embodiment shown in Figures 1 and 2.

The pedestal 40 passes through the ridge tile 22 which has been trepanned or otherwise provided with a hole beforehand to accommodate the pedestal 40 and the pedestal

is adjusted so the eyebolt 42 extends above the ridge tile 22. The pedestal 40 is fixed in the desired position by tightening clamp 34. Silicone sealant 41 is located around the pedestal where it passes through the ridge tile.

5 The upper bracket 36 guides movement of the pedestal in the vertical direction and restrains the pedestal against bending moments in the event of a load applied via the eyebolt following a fall.

10 Reference is now made to Figure 3 of the drawings which depicts identical roof and ridge anchor arrangements to that shown in Figure 1 with like numerals referring to like parts except that the pedestal has been extended so that it can be used with horizontal safety line systems. The pedestal in this case is 45 mm in diameter to
15 accommodate larger bending moments. In this case, it will be seen that a separate flexible elastomer seal 44 surrounds the pedestal where it passes through the ridge tile to prevent the ingress of water and other debris beneath the ridge tile.

20 Reference is now made to Figure 4 of the drawings which shows an embodiment similar to Figure 1 in which like numerals refer to like parts. In this case, the plate 26 has a different arrangement of slots 28 which accommodate various pitches of roof truss and the top bracket 36 is
25 replaced by another clamp 34 so that there are two spaced clamps 34 in this embodiment. In addition, it will be seen that lead flashing 45 is placed over the ridge tile as shown to further seal around the pedestal which passes

through the ridge tile 22.

Reference is now made to the fourth embodiment of the invention as shown in Figure 5 of the drawings in which like numerals also refer to like parts. This roof anchor is substantially identical to that shown in Figure 4 except for the positioning of the slots 28 on the plate 24. In this case, it will be seen that the slots 28 overlie rafters 11a,b and in order to mount this roof anchor holes have to be drilled in rafters 11a,b opposite the slots.

A plate similar to plate 32 is positioned on the other side of rafters 11a,b and bolts 30 which pass through the rafters are secured in place by nuts (not shown in the interests of clarity) in a similar manner to that shown in Figure 2 of the drawings. Therefore, it will be understood that in this particular case the structural integrity of the rafters is disrupted by the bolts passing through but this is acceptable in cases where the rafters are sufficiently deep.

Figure 6 of the drawings shows a fifth embodiment of a roof anchor in accordance with the present invention. The anchor shown in Figure 6 is different to that shown in Figs. 1 to 5 in that it is designed for use with roofs having a ridge batten. For ease of understanding, like numerals will refer to like parts already referred to in Figs. 1 to 5. In this case, it will be appreciated that it is not possible for a flat plate to span across the truss and instead the plate consists of two plates forming a right angle section with one plate 26a abutting the

rafter 11a and the other plate 26b abutting the ridge batten 50. In this case, plates 24a,b have slots 28a,b for receiving bolts 30, only one of which is shown in the interests of clarity. The bolt 30 passes through the ridge batten 50 and a separate plate 52 is located on the other side of the ridge batten and the nut 54 is used to clamp the bolt 30 so that the plate 26b is securely fastened to the ridge batten. This is repeated for plate 26a.

In this case, two spaced pedestal clamps 34 are provided and fitted between the plates 26a,b such that the pedestal 40 is essentially confined to the corner of the plate. It will be seen that the pedestal does not extend through the exact apex of the roof and instead is offset.

This means that the pedestal does not pass through the top dead centre of the ridge tile and the ridge tile must have a hole 56 trepanned therein slightly offset from the centre, as shown in Figure 6. It will also be seen that in this case silicone sealant is located around the pedestal in the aperture in the ridge tile and lead flashing 45 is also located over the eyebolt onto the ridge tile 22. It will be appreciated that the eyebolt could extend through top dead centre by swan-necking the pedestal and the threaded rod inside to give a lazy-S type shape.

Reference is now made to Figures 7 and 8 of the drawings which illustrate a roof anchor 60 in accordance with a sixth embodiment of the present invention. The anchor 60 is shown secured to a roof truss 10 with the

upper end of the pedestal 40 extending through the ridge tile 22a. The clamp means of this embodiment are in the form of channel sections 62, 64. This provides a more compact arrangement than the embodiments utilising plates, and also reduces material costs. A pair of U-bolts 66, 68 is provided to fasten the sections 62, 64 together and also to secure the pedestal 40 to the first channel section 62. The upper U-bolt 66 passes over the rafters 11a, 11b and in certain situations this may require that a section of sarking 14 is removed at the ridge. The lower U-bolt 68 passes between the struts 11c, 11d.

The anchor 60 resists forces applied to the eyebolt 42a by virtue of the friction between the faces of the channel sections 62, 64 and the truss 10 and, in the event of movement of the anchor 60, by engagement of the U-bolts 66, 68 with rafters 11a, 11b and the struts 11c, 11d.

Compared to the other embodiments described above this form of anchor 60 is relatively inexpensive to manufacture due to the reduced material requirements, the minimal number of parts required and the minimal assembly requirements.

Reference is now made to Figure 9 of the drawings which illustrates a roof anchor 80, in accordance with an eighth embodiment of the present invention, secured to a ridge batten or beam 50. The anchor 80 comprises a compression plate 82 for location on one side of the beam 50 and a clamp plate 84 on the other side of the beam. As with the anchor 60 described above, the anchor 80 includes

two U-bolts 86, 88 for fastening the plates 82, 84 to the beam 50 and for securing the pedestal 40 to the compression plate 52. The U-bolts 86, 88 pass over and under the beam 50, respectively.

5 The load experienced by the anchor 80 in the event of a fall is likely to create a considerable movement on the beam 50. Accordingly it is envisaged that this form of anchor will only be utilised on relatively deep ridge beams, typically beams which are more than 123 mm (five
10 inches) deep.

 It will be appreciated that various modifications may be made to the embodiments hereinbefore described without departing from the scope of the invention. For example, although the means for securing the pedestal to the roof
15 truss is by two plates, it could be achieved by any other suitable fastening means as long as the pedestal can be disposed relative to the truss so as to pass through the ridge tile as shown. It will also be appreciated that although the pedestal is adjustable in height it could, in
20 fact, be fixed in height for specific dimensions of roof and ridge tiles. It will be understood that the ridge anchor hereinbefore described may be used on roofs without sarking and that lead flashing may be applied above the anchors in all embodiments.

25 It will be appreciated that an advantage of the present invention is that it can be fitted to modern types of truss which do not have a ridge batten as well as roofs with a ridge batten. In some cases when so fitted to

these trusses there is no damage to the truss and mounting of the ridge anchor does not affect the structural integrity of the truss. A further advantage of the embodiments described is that the pedestal is adjustable in height to accommodate a variety of truss and ridge tile styles and the ridge anchor can be easily modified to suit horizontal line safety systems.

CLAIMS

1. A roof anchor comprising:

first anchor clamp means for engaging an upper part or side of a roof truss or ridge batten;

5 second anchor clamp means for engaging the other side of said roof truss or ridge batten;

fastening means for securing said first and second clamp means together to secure the roof anchor to the upper part of said roof truss or said ridge batten; and

10 securing means for receiving and securing a roof anchorage element to said first clamp means, said roof anchorage element being generally elongate and being adapted to be secured by said securing means to said first clamp means with an upper end portion extending above a
15 ridge tile, said roof anchorage element having harness attachment means or line fastening means at its upper end to enable a user to secure a safety line or the like to the roof anchor in use.

2. The roof anchor of claim 1 wherein said roof anchorage
20 element is a pedestal and the harness attachment or line fastening means is an eyebolt.

3. The roof anchor of claim 1 or claim 2 wherein the first anchor clamp means is a flat plate defining apertures or slots to receive the fastening means.

4. The roof anchor of claim 3 wherein the second clamp means is a flat plate.

5 5. The roof anchor of claim 1 or claim 2 wherein one or both anchor clamp means are in the form of channel profiles.

6. The roof anchor of any of claims 1, 2, 3 or 5 wherein the second clamp means is in the form of one or more washers.

10 7. The roof anchor of claim 1 or claim 2 wherein one or both of the anchor clamp means is in the form of angled plate.

15 8. The roof anchor of any of the preceding claims wherein the first anchor clamp means includes securing means in the form of a lower adjustable clamp and an upper bracket with an aperture for receiving the roof anchorage element.

9. The roof anchor of any of claims 1 to 7 wherein the first anchor clamp means includes securing means in the form of two spaced adjustable clamps.

20 10. The roof anchor of any of claims 1 to 7 wherein two spaced U-bolts serve as both the securing means and the fastening means.

11. The roof anchor substantially as described herein and as illustrated in Figures 1 and 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7 or 8, or Figure 9 of the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

17

Application number
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Relevant Technical Fields

- (i) UK Cl (Ed.N) E1S (SL)
(ii) Int Cl (Ed.6) E04G 21/32

Search Examiner
MR A MITCHELL

Date of completion of Search
6 SEPTEMBER 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant
following a search in respect of
Claims :-
1 TO 11

(ii)

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| Category | Identity of document and relevant passages | Relevant to claim(s) |
|----------|--|----------------------|
| A | GB 2071196 A (FULTON) equivalent of acknowledged prior art | 1 |
| A | US 5287944 (WOODYARD) | 1 |

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